

CLAIMS

1. A semiconductor light emitting device, comprising:
 - a substrate;
 - 5 a first conductive type first cladding layer formed on said substrate;
 - an active layer formed on said first cladding layer; and
 - a second conductive type second cladding layer
- 10 formed on said active layer, a part thereof having a ridge-shaped portion as a current narrowing structure; wherein said ridge-shaped portion of said second cladding layer includes a first ridge-shaped layer on the side close to said active layer and having a high bandgap
- 15 and a second ridge-shaped layer on the side distant from the active layer and having a low bandgap.
2. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer and said second ridge-shaped layer are a layer with a high aluminum composition ratio and a layer with a low aluminum composition ratio, respectively.
- 20 3. A semiconductor light emitting device as set forth in claim 2, wherein
 - an aluminum composition ratio X_1 of said first ridge-shaped layer is $0.60 \leq X_1 \leq 0.70$, and

an aluminum composition ratio X_2 of said second ridge-shaped layer is $X_2 \leq X_1$.

4. A semiconductor light emitting device as set forth in claim 2, wherein

5 an aluminum composition ratio X_1 of said first ridge-shaped layer is 0.70, and

an aluminum composition ratio X_2 of said second ridge-shaped layer is 0.65.

5. A semiconductor light emitting device as set forth 10 in claim 1, wherein a film thickness of said first ridge-shaped layer is 50 to 400 nm.

6. A semiconductor light emitting device as set forth in claim 1, wherein a sum of a film thickness of a portion excepting said ridge-shaped portion of said 15 second cladding layer and a film thickness of said first ridge-shaped layer is 750 nm or smaller.

7. A semiconductor light emitting device as set forth in claim 1, wherein an etching stop layer is formed on a boundary face of a portion excepting the ridge-shaped 20 portion of said second cladding layer and said first ridge-shaped layer.

8. A semiconductor light emitting device as set forth in claim 1, wherein said first cladding layer, said active layer and said second cladding layer are formed by 25 an AlGaInP-based material.

9. A semiconductor light emitting device as set forth in claim 1, wherein said first cladding layer, said active layer and said second cladding layer are formed by an AlGaN-based material.
- 5 10. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer is formed by a layer having an equal refractive index to that of a portion excepting said ridge-shaped portion of said second cladding layer.
- 10 11. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer is formed by a layer having a lower refractive index than that of a portion excepting said ridge-shaped portion of said second cladding layer.
- 15 12. A semiconductor light emitting device as set forth in claim 11, wherein an aluminum composition ratio of said portion excepting said ridge-shaped portion of said second cladding layer is 0.68, and
an aluminum composition ratio of said first ridge-shaped layer is 0.75 to 0.80.
- 20 13. A method of producing a semiconductor light emitting device, including:
a step of forming at least a first conductive type first cladding layer, an active layer and a second conductive type second cladding layer by stacking on a

substrate by an epitaxial growth method; and
a step of processing a ridge-shaped portion as a
current narrowing structure at a part of said second
cladding layer;

5 wherein, in the step of forming said second
cladding layer, a portion to be said ridge-shaped portion
is formed to include a first ridge-shaped layer on the
side close to said active layer and having a high bandgap
and a second ridge-shaped layer on the side distant from
10 the active layer and having a low bandgap.

14. A method of producing a semiconductor light
emitting device as set forth in claim 13, wherein
in the step of forming said second cladding layer,
a layer having a high aluminum composition ratio and a
15 layer having a low aluminum composition ratio are formed
as said first ridge-shaped layer and said second ridge-
shaped layer, respectively.

15. A method of producing a semiconductor light
emitting device as set forth in claim 14, wherein
20 in the step of forming said second cladding layer,
a layer having an aluminum composition ratio X_1
satisfying $0.60 \leq X_1 \leq 0.70$ is formed as said first
ridge-shaped layer and a layer having an aluminum
composition ratio X_2 of $X_2 \leq X_1$ as said second ridge-
25 shaped layer.

16. A method of producing a semiconductor light emitting device as set forth in claim 14, wherein
in the step of forming said second cladding layer,
a layer having an aluminum composition ratio X_1 of 0.70
5 is formed as said first ridge-shaped layer and a layer
having an aluminum composition ratio X_2 of 0.65 is formed
as said second ridge-shaped layer.
17. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein
10 in the step of forming said second cladding layer,
said first ridge-shaped layer is formed to have a film thickness of 50 to 400 nm.
18. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein
15 in the step of forming said second cladding layer,
a sum of a film thickness of a portion excepting said ridge-shaped portion of said second cladding layer and a film thickness of said first ridge-shaped layer is made to be 750 nm or smaller.
- 20 19. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein
in the step of forming said second cladding layer,
an etching stop layer is formed on a boundary face of a portion excepting said ridge-shaped portion of said
25 second cladding layer and said first ridge-shaped layer.

20. A method of producing a semiconductor light emitting device as set forth in claim 19, wherein in the step of processing said ridge-shaped portion as the current narrowing structure at the part of said 5 second cladding layer, the part of said second cladding layer is processed to be said ridge-shaped portion by etching which stops at said etching stop layer.
21. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein said 10 first cladding layer, said active layer and said second cladding layer are formed by an AlGaInP-based material.
22. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein said first cladding layer, said active layer and said second 15 cladding layer are formed by an AlGaN-based material.
23. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein in the step of forming said second cladding layer, a layer having a same refractive index as that of a 20 portion excepting said ridge-shaped portion of said second cladding layer is formed as said first ridge-shaped layer.
24. A method of producing a semiconductor light emitting device as set forth in claim 13, wherein 25 in the step of forming said second cladding layer,

a layer having a lower refractive index than that of a portion excepting said ridge-shaped portion of said second cladding layer is formed as said first ridge-shaped layer.

- 5 25. A method of producing a semiconductor light emitting device as set forth in claim 24, wherein in the step of forming said second cladding layer, a layer having an aluminum composition ratio of 0.68 is formed as a portion excepting said ridge-shaped portion 10 of said second cladding layer and a layer having an aluminum composition ratio of 0.75 to 0.80 is formed as said first ridge-shaped layer.